



Substitute Specification
Clean Version

Attorney Docket No. 3339.12US02

VACUUM HEAT TREATMENT FURNACE AND METHOD OF AND APPARATUS FOR
MEASURING CARBON CONCENTRATION IN ATMOSPHERE HAVING REDUCED
PRESSURE

Related Application

This application is a division of Application No. 10/108,770 filed March 28,
2002, now U.S. Patent No. 6,709,629.

Background of the Invention

1. Field of the Invention

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The present invention relates to a vacuum heat treatment furnace, and more particularly to a vacuum heat treatment furnace structured so as to prevent a deterioration due to a carburizing and increase an efficiency of thermal energy with respect to a subject or a work to be treated in a vacuum heat treatment, a vacuum carburizing treatment and the like, and a method of and apparatus for measuring a carbon concentration in an atmosphere having a reduced pressure.

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2. Description of the Prior Art

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A method of carburizing an iron and steel material under reduced pressure conventionally includes a vacuum carburizing method carried out by introducing a hydrocarbon series gas within a furnace, in which a carbon material is frequently employed for a heat insulating material and a heater as furnace constituting members, and a heat resisting steel, a heat resisting cast steel, a carbon series material or the like is employed for a hearth rail for supporting the subject to be treated and a hearth roller for transferring. Further, the vacuum heat treatment furnace is of a type in which a furnace wall is water cooled and a type in which the furnace wall is